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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,582	03/31/2001	Alexander V. Reshetov	42390P8654	6822

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EXAMINER	
NGUYEN, KIMBINH T	
ART UNIT	**PAPER NUMBER**
2671	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/823,582	RESHETOV ET AL.	
	Examiner	Art Unit	
	Kimbinh T. Nguyen	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *28-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *28-66* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to amendment filed 07/22/04.

2. Claims 28-66 are pending in the application.

3. The rejections of claims 28-33 and 64 under 35 U.S.C 101 have been withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 28-38, 40-51, 55, 58-61, 63-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perry, U.S. Patent No. 6,483,518, in view Fan et al. (6,704,693).

Claim 28, Perry discloses a machine-readable data structure stored on a machine-readable medium (col. 8, lines 33-35) comprising appearance data (col. 10, line 31) for a plurality of nodes (col. 19, line 9) that represent a portion of a surface of a three-dimensional object (col. 8, lines 1 1-12), displacement data for each node (col. 8, lines 13-14 and Figure 1, num. 106) from a reference (Figure 1, num. 107) and coordinate system data (col. 8, line 2), where the 3 types of data are on one data structure (col. 8, lines 2-8). Perry does not disclose where the coordinate system data is local to the nodes; however, Fan et al. discloses a local coordinate system data that indicates a local coordinate system for the nodes (col. 10, lines 16-22). It would have

been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the local coordinate system for the nodes taught by Fan into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because it would establish a constraining relationship between the degrees of freedom of each node (independent) on the first of the opposed portions and the degrees of freedom of one or more nodes on the second of the opposes portions and perform a finite element structural analysis of the object (col. 3, lines 59-66).

Claim 29, Perry discloses appearance and displacement data with an independent value for each of the nodes (Perry, col. 10, lines 28-33).

Claim 30, Perry discloses where the coordinate system data indicates a base plane (Perry, col. 7, line 67 and Figure 1) and where the displacement data indicates a displacement distance from a corresponding reference in the plane (Perry, col. 8, lines 13-15).

Claim 31, Perry discloses where the coordinate system data comprises an origin, first axis, second axis (Perry, col. 7, line 67) and length associated with the first axis (Perry, Figure 1).

Claim 32, Perry discloses where the appearance data comprises color data (Perry, col. 8, line 8).

Claim 33, Perry allows the user the option to select any number of nodes (i.e., in order to provide efficiency for recursive procedures in that there is a central node for

each division see Perry, col. 19, line 10, which allows any number of nodes to be selected and col. 15, lines 1-2, for recursive subdivision of cells).

Claim 34, Perry discloses a method for creating computer graphics (Perry, col. 7, lines 60-61).

Claim 35, Perry discloses a display device Perry (col. 20, line 67).

Claim 36, Perry discloses accessing graphical data for a plurality of nodes Perry, col. 19, line 9) that represent a portion of a surface of a three-dimensional object Perry, col. 8, lines 1 1-12). The remarks presented above with respect to claim 28 apply equally to the remainder of this claim.

Claims 37 and 38, the rationale provided in the rejections of claims 29, 30 and 36 are incorporated herein.

Claim 40, Perry discloses determining four pixels of a quadrilateral that correspond to four nodes from the plurality of nodes, determining an inner pixel contained within the quadrilateral (Perry, Figure 25) and interpolating a value for the inner pixel by using neighboring vertices (Perry, col. 19, line 39 to col. 20, line 4).

Claim 41, Perry discloses determining four pixels of a quadrilateral that correspond to four nodes from the plurality of nodes, determining an inner pixel contained within the quadrilateral (Perry, Figure 25) and interpolating a value for the inner pixel by using neighboring vertices (Perry, col. 19, line 39 to col. 20, line 4).

Claims 42-47, the rationale provided in the rejections of claims 28-30, 33 and 35 are incorporated herein.

Claim 48, Perry discloses a rendering unit (Perry, col. 21, line 14). The rationale provided in the rejection of claim 28 is incorporated herein.

Claim 49, the rationale provided in the rejections of claims 29 and 48 are incorporated herein.

Claim 50, the rationale provided in the rejections of claims 30 and 48 are incorporated herein.

Claim 51, the rationale provided in the rejections of claims 31 and 48 are incorporated herein.

Claim 55, Perry does not discloses the rendering unit comprises software; however, Fan et al teaches using commercial software in a structural analysis (col. 11, lines 23-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the software taught by Fan into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because using software in a structural analysis, it would reduce design costs and time-to-market (col. 1, lines 27-28).

Claim 58, Perry discloses a computer rendering graphics (col. 8, line 22).

Claims 59-61, 63, 65 and 66, the rationale provided in the rejections of claims 29, 31, 33 and 35 are incorporated herein.

Claim 64, Perry discloses spatial patch means (parametric patches; col. 17, line 13 through col. 18, line 67).

6. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perry et al. (6,483,518) in view of Fan et al. (6,704,693) and further in view of Cox et al. (5,751,931).

Claim 39, Perry in view of Fan does not teach disclose removing a node if it lies outside a view volume represented by a clipping function. However, Cox discloses a clipping surface, which obscures nodes that do not meet a threshold value (col. 2, lines 53-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate removing a node if it lies outside a view taught by Cox into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because it would allow users interactively manipulate the clipping surface (col. 2, lines 57-60).

7. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perry in view of Fan et al. (6,704,693), further in view of John (6,366,289).

Claim 52, Perry in view of Mallet does not disclose chunks, or memory partition areas. However, Johns discloses "chunks" which partition memory into 217 regions (col. 5, line 61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the "chunks" taught by John into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because utilizing chunks to partition the memory of a spatial patch, it would optimize memory utilization (see Johns, col. 5, lines 62-64).

8. Claims 53, 54, 56, 57 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perry in view of Fan et al. (6,704,693), further in view of Mori (6,704,018).

Claims 53, 54, 56, 57 and 62, Perry in view of Mallet does not disclose logic to execute SIMD instructions. However, Mori discloses SIMD instructions (col. 13, line 65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the SIMD taught by Mori into the data structure representation for the sampled distance field of Perry for performing a finite element structural analysis of the object, because utilizing SIMD instructions, it would increase processing speed by sharing the processing load among multiple processors (see Mori, col. 4, lines 64-67).

Response to Arguments

9. Applicant's arguments with respect to claim 28 has been considered but are moot in view of the new ground(s) of rejection. Claim 28 has been modified in this Office Action, Fan teaches local coordinate system that indicates a local coordinate for nodes (3 nodes in the triangles of figs. 9-11). The rejections of claims 28-66 maintain.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimbinh T. Nguyen whose telephone number is (703) 305-9683. The examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Friday from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 3, 2004

/Kimbinh Nguyen/

Kimbinh Nguyen

Patent Examiner AU 2671